Abstract Submitted
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Evaluating fitting models of the missing energy contribution of Ar and Ti nuclear shell orbitals using the E12-14-012 (e, e′ p) scattering experiment at Jefferson Lab[1] ZACHARY JERZYK, St. Norbert College, ADAM DIRICAN, University of Maryland: College Park — The Deep Underground Neutrino Experiment (DUNE) will probe CP-symmetry violation by observing neutrino and antineutrino oscillation rates, detect supernovae neutrinos, and potentially inform new grand unification theories by making the first observation of proton decay. DUNE will use a liquid argon time-projection chamber (LAr-TPC) detector; however, little work has been done on electron-nucleus scattering for isospin nonsymmetric atoms or neutrino-nucleus scattering for argon-40. In the Hall A experiment E12-14-012 at Jefferson Lab, the (e, e′ p) scattering cross sections of argon (N=22) and titanium (Z=22) were measured against a detailed Monte Carlo (MC) simulation. Various kinematical cuts were performed on the experimental data and MC for signal identification. Minimization was performed on each orbital's cross section as a function of missing energy against either a Gaussian (symmetric) or Maxwell-Boltzmann (nonsymmetric) distribution and dependence or independence of the function on the mean energy. In this talk, I will discuss how the initial fit models of argon and titanium were modified, how the quality of fit is evaluated, and how this will inform our error analysis on the argon and titanium proton spectral functions.

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